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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,870	12/02/2003	Hang Li	10541-1851	2760
7590	12/20/2005		EXAMINER	
MacMillan, Sobansky & Todd, LLC One Maritime Plaza, 4th Floor 720 Water Street Toledo, OH 43604-1619			BAREFORD, KATHERINE A	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/725,870

Applicant(s)

LI ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) 8-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7, drawn to a method, classified in class 427, subclass 446.
- II. Claims 8-12, drawn to an article, classified in class 428, subclass 653.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by another and materially different process, such as applying the coating to the entire heat shield, rather than in specific regions previously located.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with John Card on September 20, 2005 a provisional election was made with traverse to prosecute the invention of Group I,

claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-12 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### *Specification*

6. The disclosure is objected to because of the following informalities: in paragraph [0003], "NVH" should be defined.

Appropriate correction is required.

#### *Claim Rejections - 35 USC § 112*

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for thermal spraying an Al-Si coating on a heat

shield for catalytic converters, does not reasonably provide enablement for general application of an Al-Si coating onto a general heat shield. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

In the disclosure as filed, the only method for applying the Al-Si coating is given as thermal spraying. There is no indication that any other method of applying the coating, such as from a slurry or by chemical vapor deposition, will give the desired vibration damping effects. One of ordinary skill in the art would have to perform undue experimentation to determine what other, if any, application methods would provide the desired vibration damping.

Furthermore, in the disclosure as filed, the only form a heat shield to be treated is identified as a heat shield for catalytic converters. There is no indication that any other heat shield, for shielding other devices, has the vibration problem or that this problem would be solved by the coating method. One of ordinary skill in the art would have to perform undue experimentation to determine what other, if any, heat shields would need and obtain the desired vibration damping.

9. Claims 4-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 4, the composition of the Al-Si is claimed as being "in the range of about Al-Si 4% to Al-Si 18%", and in claim 5, the composition of the Al-Si is claimed as being "about Al-Si 12%". However, neither the claims nor the specification provide the units of the percentages. Is the percent in weight, or volume, etc? Since one of ordinary skill cannot determine what units the percentages are in, it is impossible to determine what the exact composition of the claimed alloy is.

*Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art, Smith (US 2355568), Hartsock et al (US 5530213) and Masumoto et al (US 4859252).

The admitted state of the prior art, at paragraphs [0002]-[0005], teaches that it is well known to provide catalytic converters with external heat shields made from sheet metal. The admitted state of the prior art further teaches that these shields provide a significant problem with noise, and to reduce noise it has been known to use metal liners, that are expensive to manufacture and very heavy. As a result, there is a need for an improved vibration damper for heat shields in catalytic converters.

The admitted state of the prior art teaches all the features of these claims except (1) the locating of regions of the heat shield with maximum resonance vibrations and applying a porous coating of Al-Si to the heat shield by thermal spraying in the located regions to provide a vibration damping layer, (2) the composition of the Al-Si alloy and (3) the stainless steel heat shield.

Smith teaches a method for vibration damping of metal panels that can be used for forming part of a structure. Page 1, column 1, lines 1-35. Thin sheet metal panels forming part of a structure subject to vibratory movements often vibrate in sympathy with the vibrations of the structure, leading to audible noise. Page 1, column 2, lines 5-30. Such noise can be damped with a sprayed insulation material. Page 1, column 2, lines 5-30. Smith teaches to insulate panels against vibration by applying insulation to specific, spaced areas of the panel. Page 1, column 2, line 40 through page 2, column 1,

line 55. This reduces the weight of the applied material and the cost of the insulation.

Page 1, column 2, line 40 through page 2, column 1, line 15. The vibrations are understood to vibrate outward from the center, and thus, insulation is applied to the center of the panel, as this is the point of maximum amplitude of vibration. Page 2, column 1, lines 10-55. Furthermore, the insulation is applied to areas outwardly from the center in a decreasingly thick manner somewhat corresponding to the decrease in amplitude of vibration which would otherwise be present. Page 2, column 1, lines 10-55. The areas of insulation can be applied in a multitude of different shapes and desires. Page 2, column 1, lines 10-55.

Hartsock teaches that in order to apply sound damping characteristics to a sheet metal manifold of stainless steel, a thermal spray coating (plasma or wire arc) can be applied. Column 2, lines 40-55 and column 3, lines 1-30. The coating can be a porous coating of stainless steel or other suitable, compatible metal material. Column 3, lines 15-30.

Masumoto teaches that a desirable metal alloy with high damping characteristics for preventing vibration and noise pollution is an aluminum-silicon alloy. Column 1, lines 10-20. The alloy can be 0.3-<sup>2</sup>30 wt% silicon, remainder aluminum. Column 1, lines 40-50. For example, the alloy can be 9 wt% silicon. Column 2, lines 65-68. Other examples, include 11 and 13 wt% silicon. Column 4, lines 25-35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art to locate regions of the



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heat shield with maximum resonance vibrations and to apply a vibration damping coating to the heat shield in these areas as suggested by Smith in order to provide a lower weight and lower cost heat shield, because the admitted state of the prior art teaches a need for vibration damped heat shields of lower weight and lower cost, and Smith teaches that when vibration damping articles made from sheet metal it is desired to apply vibration damping coating to the area of highest vibration and to other spaced areas of vibrational problems, thus providing a coating of lower weight and lower cost as compared to a coating covering the entire surface. As it is taught to provide the coating to the area of highest vibration, it would be suggested that such areas must be located before coating. It would further have been obvious to modify the admitted state of the prior art in view of Smith to further provide the vibration damping coating as a porous metal alloy coating applied by thermal spraying of a stainless steel heat shield as suggested by Hartsock in order to provide a desirable vibration damping coating, because the admitted state of the prior art in view of Smith teaches to provide a vibration damping coating to specific areas of an article such as a sheet metal heat shield, and Hartsock teaches that a thermal spray coating of porous metal alloy provides desirable vibration damping on sheet metal articles, and that such sheet metal can desirably be stainless steel. It would further have been obvious to modify the admitted state of the prior art in view of Smith and Hartsock to provide the metal alloy is Al-Si, such as Al-Si 11 or 13 wt% as suggested by Masumoto, in order to provide a desirable vibration damping, as the admitted state of the prior art in view of Smith and

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Hartsock teaches to provide a vibration damping coating to specific areas of an article such as a heat shield by thermal spray a porous metal alloy coating, and Masumoto teaches that a desirable vibration damping coating can be an Al-Si alloy, such as Al-Si 11 or 13 wt%. Given the range of teaching of Masumoto, it would be expected that a desirable coating could also be about 12 wt% Si, as the range from 11-13 wt% Si is taught.

13. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Smith, Hartsock and Masumoto as applied to claims 1 and 4-7 above, and further in view of Kim (US 6206459).

The admitted state of the prior art in view of Smith, Hartsock and Masumoto teaches all the features of these claims except the method of identifying the regions.

However, Kim teaches that it is well known to perform vibration analysis of articles using computer aided engineering. See column 1, lines 35-50.

It is the Examiner's position that it is well known in the art to identify areas of specific vibration with a laser vibration scan. If applicant disagrees, he should so state on the record in response.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art in view of Smith, Hartsock and Masumoto to perform identification of vibration regions using computer aided engineering or laser scanning as suggested by Kim, in order to find the desired

areas for coating, because the admitted state of the prior art in view of Smith, Hartsock and Masumoto teaches to provide vibration damping coating on specific areas of an article, including of maximum vibration, and Kim teaches that computer aided engineering is a well known way performing vibrational analysis of articles and it is the Examiner's position that laser scanning is another well known way of identifying vibrational regions.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER